TITLE

SEMI-FINISHED ARTICLE WITH AN INTERLINKED STRUCTURE FOR THE GOLDSMITH AND COSTUME JEWELRY FIELD, PRODUCTION PROCESS THEREFOR AND GOLDSMITHERY PRODUCTS OBTAINED FROM SAID SEMI-FINISHED ARTICLE.

DESCRIPTION

Field of the Invention

The present invention generally relates to the field of goldsmithery and costume jewelry and, more particularly, has as its object a semi-finished article with an interlinked structure for the goldsmithery and costume jewelry field, suitable in particular for the production of necklaces, chokers, bracelets, ear rings, pendants and similar products.

The invention also relates to a method for the production of said semi-finished article and the goldsmithery and costume jewelry products manufactured therefrom.

Background Art

A nowadays well-consolidated tendency of the above mentioned field, sustained by a market that pays ever greater attention to the aspects of an economic nature, is to propose models characterized by a high ratio between the exposed surface and their weight, i.e. models that are both light and relatively eye-catching. Of course,

complying with this requirement must not affect negatively the mechanical resistance of the product and its looseness, in particular as far as necklaces are concerned. Another important requirement that must always be met is to make available a product that will be suitable for being subjected to surface treatments that will further enhance its brightness.

Other requirements of a general character that have to be met together with those that have just been mentioned concern the possibility of producing semi-finished products usable as a basis for the production of a large variety of articles in this field by means of a simple and economic manufacturing method to be carried out preferably by conventional machinery needing only minor modifications to fit to the new production.

Finally, a constant need to be taken always into account in the goldsmithery field is to find new ornamental shapes and new production techniques featuring an high flexibility so as to make easier or also stimulate the creative activity of the designers.

With these object in mind, the present invention provides a new semi-finished product with an interlinked structure, as well as a production method thereof, providing the base material for manufacturing such goldsmithery products as necklaces, chokers, bracelets,

ear rings, pendants and other similar articles in a large variety of different models.

Another object of the present invention is to achieve the result mentioned above by means of a simple and economic procedure that can be readily automated with the use of machines having a substantially conventional structure.

Summary of the Invention

These objects are attained by means of the semi-finished article with an interlinked structure according to the invention which is made up of at least two chains arranged side-by-side in the same plane and spaced apart from each other and connected to each other by means of a plurality of crosspieces extending from a link of one chain to a link of the other chain.

The production process of the semi-finished article has the essential features set forth in claim 9 hereinbelow.

Brief description of the drawings

Further features and advantages of the present invention will become apparent from the description set forth below of an exemplary embodiment not to be considered limiting in any way, such description making reference to the drawings attached hereto, in which:

- Figure 1 shows a length of the semi-finished article with an interlinked structure according to one aspect of the invention;

- Figure 2 shows a variant of the semi-finished article with a multiple interlinked structure according to the invention;

- Figures 3 and 4 show a plan view and a side elevation of the semi-finished article of Figure 1 after it has been submitted to a finishing treatment;

- Figure 5 shows a length of the semi-finished article according to another aspect of the invention obtained from a pair of alternate link chains made of different metals;

- Figure 6 shows the semi-finished article of Figure 5 after the links made of one of the two metals are removed;

- Figure 7 shows the article according to a further aspect of the invention obtained from two chains made of different metals;

- Figure 8 shows the article of Figure 7 after removal of one of the two chains;

- Figures 9, 10 and 11 show three semi-finished articles according to the invention of the variable width type with the crosspieces arranged in various patterns.

Detailed description of the Invention

With reference to Figure 1, the base version of the semi-finished article with an interlinked structure according to the invention is formed by two chains 1 and 2 connected to each other by means of a plurality of crosspieces 3 that extend between the two chains 1 and 2 from a link of one chain to a link of the other chain. In the illustrated embodiment the two chains 1 and 2 are parallel with each other and the crosspieces 3 are equally spaced apart and of equal length. In the variation shown in Figure 2 the semi-finished article with an interlinked structure according to the invention has a multiple form constituted by a central chain 4 and two side chains 5 and 6 parallel with each other in which the links of the central chain 4 are linked to homologous links of the side chains 5 and 6 by two groups of crosspieces 7 and 8. A variation of the semi-finished article in multiple form, not shown in the drawings inasmuch as it is readily comprehensible for a person skilled in the art, envisages the central chain 4 being substituted by two chains that are paired along one side of their links, while two groups of linkage crosspieces extend from their opposite sides to join them to side chains. The number of chains may be increased, of course, and correspondingly increased the groups of linkage crosspieces as well; likewise the designer may vary the width of each group of crosspieces

or the type of the chains, thus obtaining semi-finished products of a more or less complex structure.

In both cases, and generally in the spirit of the present invention, the chains to be utilized are characterized by a relatively simple structure, as in the case of the so-called "forzatina" chain, "gourmette" chain, "rolò", "veneziana", beed chain and the like. All these well-known chains have a structure such that the side of their links are large enough to allow the connection to the linking crosspieces.

The chains, as well as the linking crosspieces, can be made of precious or non-precious metal. Different precious or non-precious metals or having different chromatic features may be used for the same article.

As regards the section of the crosspieces, it may by of any shape (i.e. circular, oval, quadrilateral, triangular, polygonal). The optimal dimension of the section of the wire, which the crosspieces are made of, will be that sufficient to give the maximum exposed surface as a result of flattening without useless increase of the weight of the product, which would occur beyond a certain wire section size.

The method for producing the semi-finished article according to Figure 1 envisages feeding the two chains 1 and 2 along a first direction, feeding the wire from which

the crosspieces are to be obtained along a second direction at right angles to the one in which the chains are fed, and subsequently cutting the wire into portions having a length equal to the length of each crosspiece. The wire portions cut in this manner are positioned between two homologous links of the two chains by moving the wire portion sideways in a direction at right angles to the plane in which the two chains are being moved forward and then welding the ends of the piece to the sides of the two homologous links.

The procedure for the production of a multiple semi-finished article like that shown in Figure 2 is altogether similar: first the semi-finished article constituted by the chains 4 and 5 and the crosspiece group 7 that connects the two chains are made and then the semi-finished article formed in this manner are fed in parallel with the chain 5 in order to proceed with connecting the respective links by means of the crosspiece group 8. In the case of the multiple semi-finished article with two paired central chains, the two individual semi-finished products are first produced and then joined together in a coplanar manner by attaching two of their chains each other along their sides.

The production of the semi-finished article with an interlinked structure according to the method described

above can be advantageously carried out in an automatic manner by means of an appropriate machine comprising a unit for feeding two chains side by side in a prefixed direction and a unit for feeding and cutting the wire into portions of a length corresponding to the length of the crosspieces. The same unit translates the wire portions along the feed direction of the two chains to arrange them therebetween. The machine also comprises a welding unit for welding these wire portions to the sides of two homologous links of the two chains. Preferably, the welding unit comprises two laser welders which weld the two ends of each wire portion to the respective links. This apparatus is not described in further detail as being easy to be assembled by a person skilled in the art starting from components well known in the field of goldsmithery apparatuses. For example, the wire feeding/cutting and wire portions translating unit is of the type commonly used for the production of crosspieces to be connected to the respective links, such as in the case of the so-called "maglia marina" (marine link) chain, while the unit for moving the two chains in the same direction is of the type employed in the machines for the production of paired chains (also known as "Bismark" chains).

In an alternative embodiment of the invention, which will be obvious for a person skilled in the art, the crosspieces may be separately produced and positioned between the chains for being welded to the chain links by means of a conventional feeder.

The semi-finished article with an interlinked structure as shown in Figure 1, and also its different embodiments like the one of Figure 2, can easily be subjected to surface polishing as a finishing treatment and used in that way as a finished product or, with a view to increasing the ratio between exposed surface and weight, the crosspieces may be flattened or fashioned in various ways, deformed in the shape of an "S" for example, to increase their brightness. An example of a semi-finished article in which the crosspieces have been subjected to a flattening or pressing treatment and then fashioned in the shape of an "S", or undulated, is shown in Figures 3 and 4.

The semi-finished article with an interlinked structure according to the present invention can be subjected to successive processing operations to obtain products of different shapes. For example, its structure may be opened in order to obtain linear chains characterized by an alternation of links and crosspieces 12, as shown in Figure 6. The opening may also give rise

to linear products in which the crosspieces 13 extend in the radial direction, as shown in Figure 8 and the radial crosspieces may or may not have a link at their free end.

The operation of opening the semi-finished article can be carried out by mechanical action, e.g. by cutting, or preferably by chemical means, i.e. by making one of the two chains, or part of its links, in a metal, such as copper, that proves soluble if reacted with a strong acid compound (shown in black in Figures 5 and 7). The links made of chemically soluble metal are indicated at 10 in Figure 5 and the chain made of chemically soluble metal are indicated at 11 in Figure 7.

For example, the chain of Figure 6 can be produced by first manufacturing a semi-finished article according to the invention like the one shown in Figure 5, wherein the two chains have alternate links made of both a precious metal and a soluble metal like copper. Similarly, to obtain the chain of figure 8, it will be necessary to start from a semi-finished article according to the invention, wherein one of the two chains is made of a metal soluble by means of a chemical treatment, such as the article shown in figure 7.

Clearly, in this case, before subjecting the article to chemical treatment, all the surface finishing

operations will have to be carried out to enable a firm holding of the product.

The semi-finished article according to the invention can also be made of the variable width (so called "scalar") type, i.e. with the crosspieces having progressively increasing or decreasaing length, as shown in figure 9. According to another embodiment of the invention, a variable pitch semi-finished article can be manufactured, as shown in figures 10 and 11, wherein the crosspieces are further arranged in an alternate sequence, for example, of the type 1-0-1-0-1 or type 1-1-0-1-0-1-1-0-1-0-. These alternating sequences, together with others that can be conceived in a very obvious manner, may also be provided for the semi-finished article shown in Figure 1 or Figure 2 in which the crosspieces are all of the same length.

Various modifications and alterations to the invention may be appreciated based on a review of this disclosure. These changes and additions are intended to be within the scope and spirit of the invention as defined by the following claims.